SUBJECT INDEX

(Volume 20)

abiotic synthesis 99, 331
absolute asymmetric synthesis 1
absorption 321
acetic acid 377
5′-adenosine monophosphate 27
adsorption 259
alanine 111
algorithm for evolutionary tree 161
alumina 483
aluminum oxide 309
amino acid activation 483
amino acid mutations 419
amino acid stability 331
amino acids 99, 233, 259, 483
amino acids-prebiotic synthesis 471
5′-AMP adsorption 27
3′, 5′-cdAMP 279
amplification 121
anticodon 303
antitumor drugs 177
arginine phosphate 309
aspartic acid 111, 259
asteroids 181
asymmetric molecule 411
asymmetric reduction 1
ATP 309
Augustine Committee 469
autopoiesis 127

basic peptides 139
bibliography 55
biochemical stereoselection 515
biosynthetic pathway 293
black smoker 93
bolide impacts 181, 199

calcium phosphate 27
carbon dioxide 199
carbon dioxide fixation 173
carbon dioxide reduction 293
carbon monoxide 199
catalytic RNA 15
cell system 127
chemical energy 145
chemical evolution 471
chemoautotrophic origin of life 173
chiral effects 121
chirality 111, 411, 515
chlorophyll adsorbates 309
chloroplasts 177
citric acid cycle 457
classification of amino acids 419
clay 377
climate of early earth 199
codon 303
codon-anticodon recognition 167
coenzymes 15
copper catalysis 401
cosmic rays 99
courmarins 177
cumulative keyword index 425
cyanides 49
cyano complexes 259

dAMP 279
dCMP 279
definition of living 127
deoxyribonucleotides 279
5′-deoxy-5′nucleosideacetic acids 151
dGMP 279
digylcine 401
dihydroorotic acid 389
diketopiperazine 249, 401
DNA topoisomerase II inhibitors 177
dTMP 279

E. coli tRNA phylogenetic tree 161
early chemical evolution 249, 389
electrochemical reduction 1
electron transport 15
emergence of life 127
enantiomeric excess 121
enantiomers 515
enbacterial 177
endosymbiotic organelles 177
Euglena 177
eukaryotic 177
evolution theory 499

ferrocyanide 259
fluorescence 321
formaldehyde 199, 293
formate 199

^{60}Co-gamma rays 111
genetic code 167
geochemical constraints 331
giant impacts 181
glyceric acid ester 145
glycine 111, 259, 401
glycolysis 145
glycylglycine 471

HCN 49
HCN polymer 49
heterogeneous catalysis 377
heterogeneous polycondensation 483
heterotrophic origin of life 173
histidine 259
human serum albumin 321
hydrogen cyanide 199
hydrogen sulfide 173
hydrolytic activity 139
hydrothermal 93
hydrothermal systems 331

imidazole 99
impact constraints 181
3′-ImdpA 279

life-defining criteria 127
life sciences 469
liquid crystals 121
living system 127

magnetic field 1
marine 93
melanoidins 269
membrane evolution 499
metastable equilibria 331
mineral surface synthesis 233
minimal cell 127
modified nucleotides 167
molecular evolution 419
molybdenium 401
montmorillonite 279
Murchison meteorite 457

N-6-ribosyladenosine 43
Na-montmorillonite 377
near UV light 293
nitric oxide 199
nonsymbiotic organelles 499
nucleic acid-like structures 369
nucleoside analogs 43
nucleotide analogs 151, 369

oligoglycine 249
oligomerization of nucleic acids 279
oligoribonucleotide hydrolysis 139
optical isomers 111, 515
origin of chirality 411
origin of life 145
origin of optical activity 1, 121
orotic acid 389, 471

peptide formation 249
peptides 483
Phe tRNA evolutionary tree 161
phosphate 309
phosphodiester bond formation 279
phospholipids 15
phosphorylation 309
photochemical modeling 199
photochemistry 321
photodehydration 389
photosensitized electron transfer 309
photosynthesis 321
planetismals 181
porphyrins 293
prebiotic chemistry 377
prebiotic evolution 269
prebiotic peptide formation 401
prebiotic synthesis 43, 389
primitive atmosphere 99, 199, 471
  composition of 199
proporphyrin IX 321
proteinoids 269, 321
proton irradiation 99
pyrite 173
pyrophosphate 309

quinolones 177

radiolysis 49, 377, 515
ribonuclease P 15
ribozymes 15
RNA catalysis 43
5S rRNA 303

selective radiodecomposition 111
selector molecules 411
β-sheet conformation 139
silica 483
silicon oxide 309
solar energy 293
solar flare particles 99
space shuttle 469
space station 469
subject index 425
submarine hot springs 93
succinic acid 457
sugar conformation 43
sugars 233

template-directed oligomerization 151, 369
transition metals 259
triglycine 401
tRNA evolution 161

universal tRNA 303
uracil 389
UV photolysis 457